

CLAIMS

What is claimed is:

1. A method, comprising:

monitoring a level of a packet queue of a protocol stack; and
disabling a normal incoming packet procedure in response to the level of the
packet queue satisfying an entry condition and enabling an alternate incoming packet procedure,
the alternate incoming packet procedure including indicating new packets, if any, to the protocol
stack at an indication rate in response to a packet processing rate and altering the indication rate
in response to the level of the packet queue satisfying one or more secondary conditions, if any.

2. The method of claim 1, further comprising, disabling the alternate

incoming packet procedure and enabling the normal incoming packet procedure in response to
the level of the packet queue satisfying an exit condition.

3. The method of claim 1, wherein the normal incoming packet procedure

includes generation of receive interrupts and automatic packet indication.

4. The method of claim 1, wherein the normal incoming packet procedure

includes a polling technique.

5. The method of claim 1, wherein the level of the packet queue satisfying

the entry condition comprises the level of the packet queue exceeding an initial threshold value.

6. The method of claim 1, wherein the indication rate comprises a rate equal

to or less than a packet processing rate.

7. The method of claim 2, wherein the level of the packet queue satisfying

the exit condition comprises the level of the packet queue falling below an exit threshold value.

8. The method of claim 2, wherein the level of the packet queue satisfying the entry condition comprises the level of the packet queue exceeding an initial threshold value, and the level of the packet queue satisfying the exit condition comprises the level of the packet queue falling below an exit threshold value.

9. The method of claim 1, wherein the indication rate comprises a rate greater than a packet processing rate, and altering the indication rate in response to the level of the packet queue satisfying one or more secondary conditions comprises reducing the indication rate in response to the level of the packet queue exceeding a limiting threshold value.

10. The method of claim 9, wherein reducing the indication rate comprises reducing the indication rate to a rate equal to or less than the packet processing rate.

11. The method of claim 9, wherein altering the indication rate in response to the level of the packet queue satisfying one or more secondary conditions further comprises increasing the indication rate in response to the level of the packet queue falling below a nonlimiting threshold value.

12. The method of claim 11, wherein increasing the indication rate comprises increasing the indication rate to a rate greater than the packet processing rate.

13. The method of claim 1, wherein the level of the packet queue corresponds to a number of outstanding packets.

14. The method of claim 1, wherein the level of the packet queue corresponds to a number of receive packet buffers.

15. The method of claim 1, wherein monitoring the level of the packet queue of the protocol stack comprises:

identifying a number of packets indicated to the protocol stack;

identifying a number of packets processed by the protocol stack; and calculating a difference between the number of packets indicated to the protocol stack and the number of packets processed by the protocol stack, wherein the difference comprises a value corresponding to the level of the packet queue of the protocol stack.

16. The method of claim 1, wherein monitoring the level of the packet queue of the protocol stack comprises:

identifying an initialization number of receive packet buffers;
identifying a number of available receive packet buffers in host memory; and
calculating a difference between the initialization number of receive packet buffers and the number of available receive packet buffers in host memory, wherein the difference comprises a value corresponding to the level of the packet queue of the protocol stack.

17. The method of claim 8, wherein the initial threshold value corresponds to a number of receive packet buffers, the number of receive packet buffers equal to a percentage of an initialization number of receive packet buffers.

18. The method of claim 8, wherein the initial threshold value corresponds to a number of outstanding packets.

19. The method of claim 8, wherein the exit threshold value is less than or equal to the initial threshold value.

20. The method of claim 1, wherein the packet processing rate comprises a rate at which receive packet buffers are returned to a device driver from the protocol stack.

21. The method of claim 1, wherein the packet processing rate comprises a rate at which packets are processed by the protocol stack.

22. A method, comprising:

monitoring a level of a packet queue of a protocol stack; and
in response to the level of the packet queue exceeding an initial threshold value,
disabling generation of receive interrupts, disabling automatic packet indication, identifying new
packets, if any, and indicating new packets, if any, to the protocol stack at an indication rate
equal to or less than a packet processing rate; and
in response to a decrease in the level of the packet queue below an exit threshold
value, enabling the generation of receive interrupts, and enabling the automatic packet
indication.

23. The method of claim 21, wherein the initial threshold value corresponds to
a number of outstanding packets.

24. The method of claim 21, wherein the exit threshold value is less than or
equal to the initial threshold value.

25. An apparatus, comprising:
a processor;
a memory, coupled to the processor, to store a plurality of machine instructions
including a protocol stack and a device driver; and
a communications interface, coupled to the processor, and capable of being
connected to a network;

wherein execution of the machine instructions by the processor cause the
apparatus to monitor a level of a packet queue of the protocol stack, and to disable a normal
incoming packet procedure associated with the communications interface and the device driver
in response to the level of the packet queue satisfying an entry condition and enable an alternate
incoming packet procedure associated with the communications interface and the device driver,

the alternate incoming packet procedure including the device driver indicating new packets, if any, to the protocol stack at an indication rate in response to a packet processing rate and altering the indication rate in response to the level of the packet queue satisfying one or more secondary conditions, if any.

26. The apparatus of claim 25, wherein execution of the machine instructions by the processor further cause the apparatus to disable the alternate incoming packet procedure and enable the normal incoming packet procedure in response to the level of the packet queue satisfying an exit condition.

27. The apparatus of claim 26, wherein the level of the packet queue satisfying the entry condition comprises the level of the packet queue exceeding an initial threshold value, the indication rate comprises a rate equal to or less than the packet processing rate, and the level of the packet queue satisfying the exit condition comprises the level of the packet queue falling below an exit threshold value.

28. The apparatus of claim 25, wherein the indication rate comprises a rate greater than a packet processing rate, and altering the indication rate in response to the level of the packet queue satisfying one or more secondary conditions comprises reducing the indication rate in response to the level of the packet queue exceeding a limiting threshold value.

29. The apparatus of claim 28, wherein altering the indication rate in response to the level of the packet queue satisfying one or more secondary conditions further comprises increasing the indication rate in response to the level of the packet queue falling below a nonlimiting threshold value.

30. An article of manufacture, comprising:

a machine-readable medium that provides instructions, which, when executed by a machine, cause the machine to monitor a level of a packet queue of a protocol stack, and to disable a normal incoming packet procedure in response to the level of the packet queue satisfying an entry condition and enable an alternate incoming packet procedure, the alternate incoming packet procedure including indicating new packets, if any, to the protocol stack at an indication rate in response to a packet processing rate and altering the indication rate in response to the level of the packet queue satisfying one or more secondary conditions, if any.

31. The article of manufacture of claim 30, wherein the machine-readable medium further provides instructions, which, when executed by the machine, further cause the machine to disable the alternate incoming packet procedure and enable the normal incoming packet procedure in response to the level of the packet queue satisfying an exit condition.

32. The article of manufacture of claim 31, wherein the level of the packet queue satisfying the entry condition comprises the level of the packet queue exceeding an initial threshold value, the indication rate comprises a rate equal to or less than the packet processing rate, and the level of the packet queue satisfying the exit condition comprises the level of the packet queue falling below an exit threshold value.

33. The article of manufacture of claim 30, wherein the indication rate comprises a rate greater than a packet processing rate, and altering the indication rate in response to the level of the packet queue satisfying one or more secondary conditions comprises reducing the indication rate in response to the level of the packet queue exceeding a limiting threshold value.

34. The article of manufacture of claim 33, wherein altering the indication rate in response to the level of the packet queue satisfying one or more secondary conditions further

comprises increasing the indication rate in response to the level of the packet queue falling below a nonlimiting threshold value.